

**REMARKS**

After entry of this amendment, claims 1, 5, 6 and 18-21 are pending. Claims 2-4, 7-17 and 22-27 have been cancelled without prejudice or disclaimer. The claims have been amended without prejudice or disclaimer and find support *inter alia* in the original claims. Claim 1 finds further support in the specification at page 2, line 33, through page 3, line 8, and page 3, lines 24-27. No new matter has been added. The amendment made to claim 1 further narrows the scope of claim 1 by incorporating the subject matter of cancelled claims 2-4 and 7, and thus, does not present any new issues that require further consideration or search. Applicants respectfully request entry of the above claim amendment as they are believed to put the claims in condition for allowance or, alternatively, in better form for consideration on appeal. Thus, entry under 37 CFR §1.116 is correct.

In the specification at pages 8 and 38, the complete name and address of the depository has been inserted as required by the Examiner. No new matter has been added.

**Claim Rejections – 35 U.S.C. § 102-103**

Claims 1-6 remain rejected as being anticipated by Stetter *et al.* (hereinafter “Stetter”) in light of DSMZ catalogue. Claims 1-7, 18-22 and 26-27 remain rejected as being obvious over Stetter, in view of DSMZ catalogue, Mori *et al.* (hereinafter “Mori”) and Seufer-Wasserthal *et al.* (hereinafter “Seufer-Wasserthal”). Applicants respectfully disagree. However, to expedite prosecution, claim 1 has been amended without prejudice or disclaimer to recite the enzyme used in the isomerization with more specificity. Applicants respectfully urge reconsideration of the rejections in view of the present amendment and further in view of the following reasons.

***35 U.S.C. § 102(b) rejection***

Claims 1-6 are rejected as being anticipated by Stetter in light of DSMZ catalogue. Applicants respectfully disagree.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegall Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). “[T]o hold that a prior art reference anticipates a claim, the Board must expressly find that every limitation in the claim was

identically shown in the single reference.” *Gechter v. Davidson*, 116 F.3d 1454, 1460 (Fed. Cir. 1997).

As discuss in the Response dated December 10, 2008, Stetter discloses formation of DL-lactic acid by *Lactobacilli* and characterization of a lactic acid racemase from several streptobacteria. Thus, Stetter teaches only the isomerization of lactic acid by a lactate racemase. Stetter does not teach or suggest any other enzymatic activity contained in the bacterial strains used and its ability to convert a substrate different from lactic acid.

As amended, claim 1 is drawn to a method using an enzyme-containing extract of a microorganism or using the intact cells of such a microorganism, but not the purified enzyme itself, for microbiological isomerization. Claim 1 further defines the microorganism useful for the claimed method by its specific racemization functionality. Additionally, it is submitted that the definition of the general formula I explicitly excludes lactic acid as substrate for the method as now claimed.

Because Stetter teaches only the isomerization of lactic acid but not any other substrate, and because Stetter teaches only the isomerization activity of a lactate racemase but not other enzymatic activities contained in the bacterial strains, Stetter does not anticipate the claims. Reconsideration and withdrawal of the rejection is respectfully requested.

### ***35 U.S.C. § 103(a) rejection***

Claims 1-7, 18-22 and 26-27 are rejected as being obvious over Stetter, in view of DSMZ catalogue, Mori and Seufer-Wasserthal. Applicants respectfully disagree and traverse the rejection.

To support a *prima facie* conclusion of obviousness, the prior art must disclose or suggest all the limitations of the claimed invention. See *In re Lowry*, 32 F.3d 1579, 1582, 32 USPQ2d 1031, 1034 (Fed. Cir. 1994). It is further noted that the Supreme Court in *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007), indicated that the *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), factors still control an obviousness inquiry. Among other things, the “scope and content of the prior art” and the “differences between the prior art and the claims” must be considered. Moreover, it is the invention as a whole, and not some part of it, which must be obvious under 35 U.S.C. §103. *In re Antonie*, 559 F.2d 618, 619 (CCPA 1977).

The Examiner relies on three references, (1) Stetter, (2) Mori, and (3) Seufer-Wasserthal, to support the finding of obviousness.

As discussed above, Stetter teaches only the isomerization of lactic acid by a lactate racemase. However, Stetter does not teach or suggest isomerization of any other substrate. Nor does Stetter teach or suggest any other enzymatic activities contained in the bacterial strains used. There is no suggestion of using the bacterial strains employed in Stetter for the microbiological isomerization of a substrate other than lactic acid.

Mori teaches a process for producing D-mandelic acid, which is an alpha-hydroxycarboxylic acid according to Formula I of claim 1. The process taught by Mori is a bioconversion comprising two steps. In the first step, culture broths, cells or treated cells of microorganisms having the ability of converting L-mandelic acid into benzoylformic acid are used. In the second step, culture broths, cells or treated cells of microorganisms having the ability of reducing benzoylformic acid into D-mandelic acid are used. The D-mandelic acid so produced is then isolated from the reaction mixture. The microorganisms capable of performing the first and second steps are provided in the specification at page 2, lines 41-48, and lines 49-56, respectively. Although *Lactobacillus* is mentioned as one potential source of the microorganisms suitable for performing the second step, neither *Lactobacillus* nor *Lactococcus* is identified as a suitable microorganism for converting L-mandelic acid into benzoylformic acid in the first step. Accordingly, it is clear that one skilled in the art, after reading Mori, would not conclude that *Lactobacillus* and *Lactococcus*, alone or in combination, are capable of performing the sequential reactions required for converting L-mandelic acid into D-mandelic acid. Rather, Mori teaches away the skilled artisan from using *Lactobacillus* or *Lactococcus* in a method for the microbiological isomerization as claimed in the present application. The Examiner relies on Mori for teaching modifying compounds obtained in isomerization reaction or resolution reactions by converting a racemic compound into an optically active isomer. However, as discussed above, since Mori teaches away from using *Lactobacillus* or *Lactococcus* in a method for the microbiological isomerization, one skilled artisan would not have been motivated to combine Stetter and Mori as suggested by the Examiner.

Seufer-Wasserthal discloses enzymatic resolution of asymmetric alcohols by means of vinyl esters of polybasic carboxylic acids. In the disclosed process, a racemic mixture of an

alcohol and a carboxylic acid are contacted with a lipase which has a preference for one enantiomeric form of the alcohol. As a result, only one form of the alcohol is preferentially converted into an ester by the lipase, thereby allowing the separation of an enantiomerically enriched alcohol and the ester. Nowhere in Seufer-Wasserthal teaches or suggests that lipase suitable for the disclosed process might be present in *Lactobacillus* or *Lactococcus*. To the contrary, as provided in Col. 3, lines 46-54, sources of suitable lipases are almost exclusively consist of yeast. The only member of eubacteria mentioned in Seufer-Wasserthal is *Pseudomonas*, which belongs to gram-negative bacteria and is clearly different from the gram-positive bacteria of *Lactobacillus* and *Lactococcus*. The Examiner relies on Seufer-Wasserthal for teaching a chemical or enzymatic enantioselective subsequent reaction that comprises esterification, but this reference suggests nothing about the microbiological isomerization of alpha-hydroxycarboxylic acids.

It is thus apparent that the “differences between the prior art and the claims” primarily is the use of the enzymes contained in the extract of a microorganism of the genus *Lactobacillus* or *Lactococcus*, or present in the intact cells of such a microorganism, in a method for the microbiological isomerization of alpha-hydroxycarboxylic acids of the formula I as recited in claim 1. As discussed above, Stetter does not teach or suggest isomerization of any substrate other than lactic acid or enzymatic activities contained in the bacterial strains used other than lactate racemase. Combination of Stetter with Mori and/or Seufer-Wasserthal does not remedy the lack of such teaching. Without such teaching, one skilled in the art would not have had motivation to combine Stetter with the extra steps taught in Mori and/or Seufer-Wasserthal with a reasonable expectation of success to arrive to the claimed invention. Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been established.

Reconsideration and withdrawal of the rejection is respectfully requested.

### CONCLUSION

For at least the above reasons, Applicants respectfully request withdrawal of the rejections and allowance of the claims. If any outstanding issues remain, the Examiner is invited to telephone the undersigned at the number given below.

Applicants reserve all rights to pursue the non-elected claims and subject matter in one or more divisional applications.

Accompanying this response is a petition for a two-month extension of time to and including July 9, 2009 to respond to the Office Action mailed February 9, 2009 with the required fee payment. No further fees are believed due. However, if any additional fee is due, the Director is hereby authorized to charge our Deposit Account No. 03-2775, under Order No. 13111-00027 US from which the undersigned is authorized to draw.

Respectfully submitted,

By /s/ Hui-Ju Wu

Hui-Ju Wu, Ph.D.

Registration No.: 57,209  
CONNOLLY BOVE LODGE & HUTZ LLP  
1007 North Orange Street  
P. O. Box 2207  
Wilmington, Delaware 19899-2207  
(302) 658-9141  
(302) 658-5614 (Fax)  
Attorney for Applicants

#663262